THE PRODUCTION OF LARGE SCALE CERAMIC PIECES AND ITS AFFECT ON THE WORKING METHODS OF THE ARTIST

PROBLEM IN LIEU OF THESIS

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CHAPTER I

INTRODUCTION

This problem concerns the production of large scale ceramic sculpture and its affect on the working method of the artist. Traditionally, Western ceramics deals with functional pieces of a personal scale, that is smaller ceramic works which serve specific utilitarian purposes. The concepts of clay as an art medium and the studio-potter have developed over only the last 125 years of Western ceramic history (Charleston, 1968, p. 309).

In the mid-nineteenth century, artists in the ceramics industry worked as designers and decorators. Because of the existing subdivision of the ceramic processes into designing, shaping, decorating, and firing; these artists were separated from the plastic clay itself. An arts and crafts movement sprang up as a reaction to this depersonalization of the processes and products of the era (Charleston, 1968, p. 309). Individual artists opened small studios to gain control and understanding of the basic techniques and procedures of the ceramic medium. Using medieval methods of production, the new artist-potters began making limited quantities of more personal, figurative and functional ceramics. The pieces were small in scale so the artist could retain full control. These studios marked the first period in Western ceramics when the artist brought critical control over this medium, even though the images were largely inspired by the Far Eastern and Near Eastern cultures where ceramics had achieved a high degree of artistry (Charleston, 1968, p. 309).

The artist-potters' understanding of clay as an art medium began to mature during the art nouveau period (Charleston, 1968, p. 313). Even though the tradition of functional, personal scale pieces predominated, the objects began to reflect Western man. The qualities of the clay and glaze were refined, although they continued to be subordinate to the applied design.

In 1940 Bernard Leach published A Potter's Book. Leach in his book established not only the qualities of the ceramic process as the main element in a piece, but the Eastern philosophies behind those qualities. He saw the tradition of function and scale as indispensable from the art.

The advances in technology at the close of World War II led to the replacement of many of the traditional ceramic objects with plastic and glass. With the public acceptance of the substitutes, ceramics was freed from its traditional role. Ceramics came into use by the young studio-potters of the early 1950's as an art medium. Influenced by the images and large format used by the abstract expressionist painters, Peter Voulkos expanded the uses of the ceramic processes to fit his monumental images (Nordness, 1970, p. 64). For the first time, Western artists began using clay as a large scale medium to transmit personal images.

With a background of ceramic education based on functional traditions, I became interested in the utilization of scale to express the qualities of the ceramic processes and the personality of the artist. More specifically I am interested in examining the changes in myself and in my working method when moving from personal to large scale expression. Thus, this creative project is concerned with the production of large

scale ceramic sculptures and an examination of the changes, if any, which occurred in the working methods of the artist making the transition from a personal to a large scale.

The project involved the production of large ceramic forms constructed from a minimum of two-hundred pounds of moist clay. The data for the problem were generated by my interaction with the ceramic processes and my reaction to the finished work. These interactions and reactions to the problems and the pieces were recorded in a personal log. The data gathered in the log were synthesized and analyzed for changes in my concept of large forms and my manner of working.

Twelve forms were constructed during the course of the project. It was possible to continue nine of the initial forms to completion. Although each individual piece differs visually, only five of the forms have been chosen for close examination because they illustrate stages in the development of the forms and changes in my working methods.

CHAPTER II

ANALYSIS OF WORK

Transfering the ceramic processes from small to large scale required that I reassess their affect on the final image. This change exaggerated the time spent on each form and affected my approach to the throwing process. Also, it altered how I textured and glazed the pieces. In fact, the progression of work was changed. The large format magnified familiar procedures and changed not only how the parts ultimately worked within the form, but how I approached the making of the individual parts. Because the bulk of the knowledge was gained during the working of each piece, the comments are directed not only to the final visual image, but also the process which helped in the formulation of that image. The following discussion of five forms selected from the twelve completed during the problem illustrates not only the individual development of each form but reflects the evolution of the project.

Form Number One

Form Number One (Figure 1.) exhibits control over the individual parts at the cost of the large form. The disjointed nature of the piece is caused by an overreaction for the structural needs of large scale. It was assembled beyond the time period in which the shape could be worked as a whole. The added tubes and slip decoration of the piece help to unify the discontinuous main mass but the glaze application adds little. In this form, I lacked the confidence necessary to risk destroying the separate masses for the whole of the large form.

Fig. 1. Form Number One

Form Number Two

This relief is the result of working within limits defined by the clay. The form (Figure 2.) was constructed from parts of a large completed piece that had collapsed. I imposed a personal order on the shapes. The primary decisions were made for me by the accident and the relief format removed most of my preoccupation with the structural needs of large scale work. The prior construction leaves throwing and other process marks. These reflections of the clay's origins were left wherever possible. The

Fig. 2. Form Number Two

marks give an interior movement to the form that serves as a foundation for the outer shape. By additions of repeating elements and textures, I tied the parts together.

I was able to work this large form free from most of the concerns and decisions I associated with large scale work. The form, which started from the collapse of a totally different form, could be worked with confidence and liberation because I felt no responsibility to the initial parts. The lack of control over the initial parts created narrow limits whereby I could concentrate on the whole form. The collapse created

extreme textures that fitted the scale of the problem and limited my choices on the form's interior. Although I feel the form is visually effective, the work resulting from the imposed limits differs, not in content, but in appearance from the other forms in the study.

Form Number Six

Form Number Six (Figure 3.) is typical of the large scale composite pieces constructed during the study. The forms developed to this point utilize the juxtaposition of natural clay movements. The scale boundaries were set for the form by the kiln shelf foundation on which the forms were constructed. This base defined four planes within which the form was manipulated. I arrived at a working balance between my control and the clay's reaction when set within the large scale limits. The three main masses were constructed to take advantage of the sagging and tearing caused by imposed tension. The action of the clay and my reaction to the movement reflected not only ceramic processes, but a relaxation of my control of the interior movement. The structural problem of large forms had been resolved in previous forms. The parts had lost their individual importance for me. This release gave me the same working conditions over the large forms as with Form Number Two, while retaining control over the separate parts.

To unite the masses into a single large form, I used repetitive elements such as connecting small shapes and glaze surface. The reocurring penetrations in the form serve as a common reference while also suggesting the interior structure. Small clay additions to bind the large image show my acceptance of a shared control with the carefully controlled pulled part and the spontaneous clay wads thrown at the form. The concern in

Fig. 3. Form Number Six

the glazing was not in the initial application but the creation of paths to guide the melted glass down the large form. Color in the glaze was used to contrast the overall surface of the piece.

Form Number Six caused me to question the validity of a shared control in the large composite forms as well as the content of the previous work. The physical factors bounded by the working conditions in which the forms were produced raised other questions of the suitability of the

format. Although I feel this large form was successful, the method created too many chance design elements to effectively control the content within the large scale format.

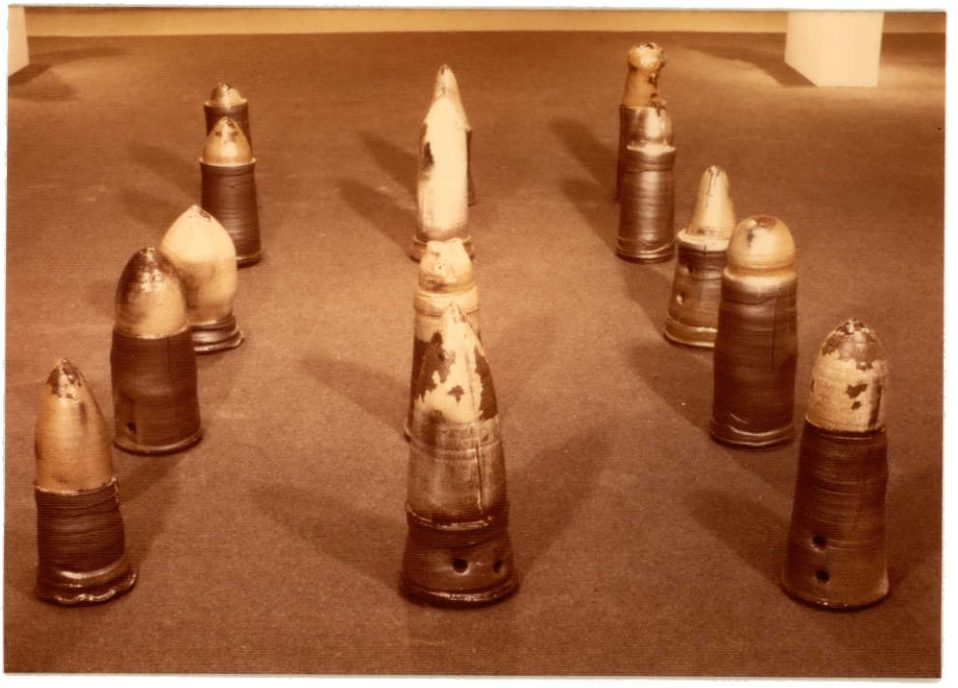

Fig. 4. Form Number Seven

Form Number Seven

Form Number Seven (Figure 4.) is a modular large scale form which maximizes my control over the total process. I adopted the traditional approach of a series, a familiar content, and the rigidity of a grid system to limit scale and method. By defining the end limits of the

format, I was able to closely control the interior elements. The individual parts and their surfaces were manipulated to give an overall continuity to the large form. I could adjust each part to be complete within itself. The sameness of the processes that the separate parts had undergone assured their blending into the overall large form.

The grouped parts set up a network that can be perceived at various levels and still reflect the whole. The form creates the bold texture of the large grid which is repeated in small scale by the "shivering" of the porcelain slip. Vertically, the parts create a negative space that reinforces the upward movement of the individual parts. Form Number Seven gains power from the tight control of the structure but denies spontaneous clay movement.

Form Number Eight

The form in Figure 5 is a melding of the experiences from the previous large forms. The traditional format of the single cylinder is used to gain a controlling element in which the natural clay movement is utilized. With the establishment of the basic form, the surface becomes paramount. The motion of the tall cylinder is enhanced by softening the mechanical character of the throwing marks. The size of the form removes the traditional orientation. The scale relationship forces the viewer to react to the form's sculptural aspect.

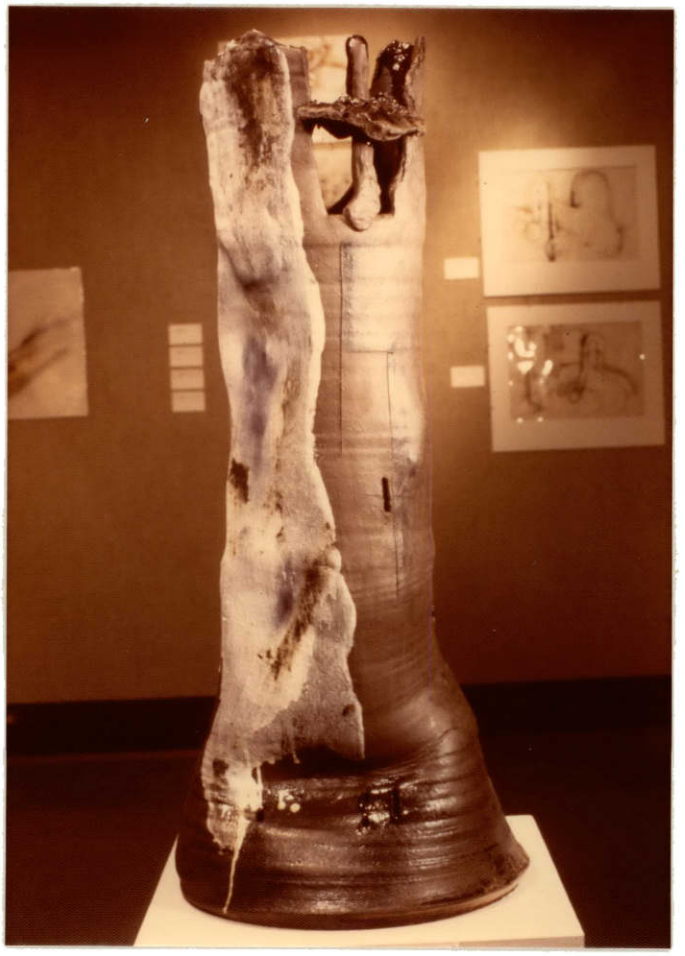

Fig. 5. Form Number Eight

Overall Characteristics of the Forms

All of the forms constructed for this study began with wheel thrown parts. The wheel allowed me to rapidly produce the parts for the forms and provided a link with ceramic traditions. Characteristic marks were left on the clay as a result of the throwing. The marks serve not as a main feature, as in smaller work, but only as another element in the design of the completed form. Symmetry, thin walls, and other con-

cerns of functional ware became unimportant. The part had to be worked not as an individual piece, but as it fit into the finished form. The taller, wider parts were more affected by physical laws; thus the reaction time to control the spinning cylinder was shortened. The large wet parts had to be formed more intuitively, relying on previous experience and training.

The structural demands of the large clay forms slowed my normal working habits. The individual parts had to be dry enough to retain the structural soundness of the piece. The initial response to the clay formed in the throwing stages could not be carried to the finished piece. Moreover, the time required between the throwing and the construction of the large forms required sustained energy of the method and the idea. The problem of retaining the directness of the medium over the extended period was partially corrected by rapidly drying the parts. As I began to construct the forms the initial ideas and responses changed as succeeding parts were combined. The individual parts also took on different character when combined into the whole. As construction progressed, the limits of the form became more defined. The clay responded within these limits, and I adjusted the forms to accept or deny the new directions of the clay.

Another consideration was the exaggeration of the normal clay movement because of the increased weight. If one part is suspended between others, the clay splits and tears with the force of gravity and the shrinkage of drying. I had to become familiar with these developments so that I could use them in the finished forms because they reflected the qualities of the medium. The method I followed, after the initial

investigations, was the setting up of boundaries within which the clay could react. I could anticipate the general movement of the clay and work with that motion.

Using large scale forms also posed new possibilities in terms of the relationship between surface and the total form. Ceramics traditionally is concerned with a tactile surface that is pleasing. Because the pieces did not need to be handled in daily use, I could use coarse textures not normally suited to ceramics. Furthermore, the large format drew importance to the surface. In fact, to see the whole form the pieces need to be viewed from a distance which necessitated a pronounced texture to draw the viewer into the form. I also wanted subtile textures to hold the interest upon close examination. Therefore, the textures were used not only for surface interest but to bind the forms.

I felt the traditional method of glazing a piece was likewise inapplicable to the massive forms. It would overpower the form and mask the textures. I therefore, confined the surface glaze to strokes and defined areas of color and used smaller clay elements to unite the larger parts. I could totally control the smaller clay parts and use them to visually and structurally complete the forms.

Large scale ceramics, because of the expanded time and the cost of each piece, require the artist to work out the details of the form before it is started. This differs from the normal procedure of working in series where each individual work develops from the preceding ones, thereby enabling the potter to use this succession of pieces to explore concepts and retain tangible examples of the progression. The changes in the concept required by large scale ceramics take place by manip-

ulating the same form. I used sketches at some stages in the development, but the drawings could not anticipate the reaction of the clay. The time investment on each form caused it to become precious to me while working the form. This attitude was contrary to all I had felt about ceramics. The wet clay is easily recycled if a small piece does not work. I felt restricted by the need to make each form work in total. I could not work spontaneously on the forms for fear of destroying them. Smaller scale had previously given me a freedom of control that I lacked with the large forms. In addition, the large scale increased the technical problems in drying and firing the forms to the degree of affecting the finished forms. All aspects of ceramic design and construction altered with the increased scale.

CHAPTER III

TECHNICAL PROBLEMS: DRYING AND FIRING

The drying and firing of the large forms posed the greatest obstacle in their production. The forms were quite fragile in the drying stages. The open studio in which the work was produced permitted students to poke and break some of the forms. Also, space to store the large work for the necessary two to three weeks drying period taxed a public facility and the crowding of the pieces slowed the construction of the forms. Loading the large scale forms into the kiln (Fig. 6) required special arrangements. Although the clay lost approximately one-third of its plastic weight in drying, forms that were composed of two-hundred pounds of clay still weighed too much to be moved by a single person. Coordination between two or more people was required when loading a form into the kiln. Also, the large forms did not use the kiln space effectively. Their size and weight prevented the stacking of other pieces safely under or over the forms. Moreover, the awkward nature of the loading process sometimes prevented the pieces being moved into an efficient placement in the kiln.

Loading the pieces into the kiln was facilitated by building the pieces directly on kiln shelves. On the shelves, a layer of vermiculite was spread to permit the clay to move as it dried and shrank. Due to the limited maneuvering space inside a kiln, some of the pieces were slid into the kiln on a heavy layer of vermiculite.

Fig. 6. Loading form into kiln

Before being loaded into the kiln, pieces had to be thoroughly dry. For example, some of the sections were four inches or thicker, and the appearance of the form was deceptive in determining the moisture content. The surface water evaporated while the interior remained wet. This uneven drying caused the pieces to crack. Before firing, an extra week of drying after the forms appeared dry insured minimum moisture content.

The firing had to proceed slowly because the chemical water given off in the early stages could cause a form to explode unless the moisture gradually steamed through the thick sections. Another problem occured at red heat during the quartz inversion with the rapid expansion and contraction of the clay body. Furthermore, a problem was encountered in the open studio with the firing procedure being hindered by rapidly raising the temperature. This firing speed, normally used for small stoneware work, resulted in the disintegration of some of the thicker sections.

The forms were fired to cone five because at this temperature the clay body becomes hard and tough, but not brittle, an important property when the large scale forms must be moved. A heavy reduction was avoided to prevent the forms being weakened by carbon coring. A small amount of back pressure and slightly yellow flame at the burner tips effectively produced a good clay color while avoiding the problem of over reduction.

Salt firing the large forms served to unify the construction physically and visually. This method sealed most of the smaller cracks which opened in the drying of the pieces. However, controlling this firing technique required a thorough knowledge of the salt kiln used and the difference in the circulation pattern set up in the kiln when firing with few or no shelves.

The increased scale of the forms required adjusting the normal studio procedures to accommodate the special needs in drying and firing the forms. Therefore, the rhythm of my working method was out of phase with the day to day output of the university studio.

CHAPTER IV

SUMMARY AND CONCLUSIONS

The change from a personal to a large scale caused a change in my relationship to the clay. The factors of time, balance, and control became critical to the production of the forms. The time span on an individual work extended from a matter of minutes to days. The structural balance of the weight within the forms placed demands on the design. The control of the forms was altered from my full control of small pieces to a shared control with the ceramic processes.

By studying how the clay reacts in imposed circumstances, I could utilize the natural tendencies of the materials within the context of my images. The difficulty of this method was the blending of the qualities of the large scale and my ideas to present a unified statement.

The physical requirements of large scale ceramics imposed restraints on me. The large pieces, prior to construction, required the solution of how the pieces would be transfered to the kiln once they had dried. The time spent in drying and firing was extended, slowing the working rhythm from my usual fast pace of personal scale production. Because of the increased size, traditional glaze techniques and surface finishes had to be evaluated within the new format. The scale changed the way in which I perceived the pieces, so that the surface had to be dealt with to sustain the viewer through the form.

The project, by design, has limited the exploration of the many technical problems encountered in large scale ceramics. Therefore, a broad range of technical questions and their solutions remain.

Large scale ceramics focuses on an individual piece instead of an ongoing series of smaller pieces, forcing me to subordinate the processes to the goal of the finished form.

APPENDIX

THE CLAY

The requirements for a clay body for large scale ceramic work are openness of body grain for drying and strength of mixture for support of the greater weight. My personal desires for the clay body were a rich clay color and enough plastic quality for throwing. The sand and vermiculite additions open the body and give it the required strength. The vermiculite also reduces the weight of the sections and produces brown burn-outs in the firing. The clay fires to a toast color at cone five with moderately reducing atmosphere. However, the clay requires more than the normal one-third by weight of water to make it plastic enough for throwing. This clay mixture fits the basic needs and my personal desires:

Hawthorn Bond Fire Clay	100
Redart Clay	50
Silica Sand	15
Vermiculite	10

This clay has the problem of low sheer strength when leather hard. When the materials are added to open the body, they decrease the plastic strength of the clay at all stages of wetness until leather hard. Handling the clay for the large forms requires careful planning to build the pieces before the clay loses the water of plasticity. In firing this body, a heavy reduction must be avoided to prevent bloating.

THE DECORATION

A standard porcelain formula thinned to the consistency of thick cream adhered well to the leather hard clay and fired to a white finish. The recipe for this mixture is:

Kaolin	25
Silica	25
Ball Clay	25
Nepheline Syenite	25

This slip glosses in a slat firing and forms a tough surface for sgraffito. Also, the slip can be used for application of coloring oxides.

In the preparation of this slip during the problem, faulty mixing equipment reduced the effective amount of ball clay in the blend altering its fit to the clay. The incorrect slip was dipped onto leather hard clay and the coating shivered off the pieces during the glaze firing. The pattern created served the form of the pieces but had to be adhered to the surface with acrylic binder.

The stains were used in their dry, powder form. The coloring each gives depends upon the concentration of the oxide and the covering glaze, if any. All the oxides in heavy application will burn a metallic gray to black. Iron oxide will color from rust to dark brown with increased amounts of the oxide. The copper oxide will turn light green to dark green in an oxidizing atmosphere to various shades of red coloring. Manganese is a weaker coloring agent than iron for more controlled browns. Cobalt is one of the strongest of the ceramic colorants. It will color bright blue on a white background to black on a dark.

I gained control over the application by rubbing the powders on the surface with my finger tips. Using this technique, the stains could be used to color and shade specific areas. Another effective method was the use of shakers to sift the material onto the surface. The stains collected in the textures of the form and reinforced them. The various coloring agents were used in conjunction with dry applications of glaze for which the mixing action took place in the firing.

I chose Pemco-P25 frit for dry application to leather hard through bone dry clay. This typical low fire frit yielded a glassy glaze from cone 05 to cone 10. It became more fluid with the temperature increase. At cone five, the frit ran down vertical surfaces but left a glassy coating in its wake. The sifted application was well suited for large scale forms but the coatings cannot be sufficiently controlled for functional ware. The frit also crazed heavily. The packing of textures with frit combined with coloring oxides to run and coat the natural contours of the piece aided in reinforcing the statement of the forms. However, care had to be taken in stacking the forms in the kilns because the loose powder was easily dislodged. Also, I had to plan for the problems of excess glaze running off the forms and coating the shelves and the posts.

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